

CLAIMS

What is claimed is:

1. A method for detecting the position of a safety guard relative to an active portion of a woodworking machine comprising:
 - establishing a predetermined safe operating position of the safety guard;
 - positioning a first electrical contact on the safety guard;
 - positioning a second electrical contact on a portion of the woodworking machine;
 - transmitting an electrical signal from said first electrical contact, said second electrical contact receiving said electrical signal only when the safety guard is in said safe operating position; and
 - activating a protective operation when said signal is not received by said second electrical contact.
2. The method of claim 1 wherein the step of establishing a predetermined safe operating position further comprises coupling the safety guard to the woodworking machine, thereby forming a closed circuit between said first electrical contact, said second electrical contact and a power switch for the woodworking machine.

3. A power tool having a sensing mechanism for detecting the position of an operators hands during the operation of a power tool, the power tool comprising:

an active portion of the power tool;

a handle portion for manipulating the position of said active portion of the power tool;

a base having a guide surface for guiding a workpiece toward engagement with said active portion, said base including a fence structure extending substantially perpendicularly from said guide surface;

a first sensor disposed on said handle and operable to detect the presence of an operator's hand on said handle;

a second sensor disposed on one of said base and said fence of the power tool, the power tool configured to activate said active portion of the power tool when the operator's hands are detected by said first and second sensor.

4. The power tool of claim 3 wherein said first and second sensors are electrically connected in series.

5. The power tool of claim 3, further comprising a third sensor disposed on the power tool, said third sensor electrically connected in parallel with said second sensor and said second and third sensor electrically connected in series with said first sensor.

6. A sensing mechanism for detecting the position of an operators hands during the operation of a power tool comprising:

an active portion of the power tool;

a guard oriented proximate to said active portion of the power tool;

a light emitting device disposed on a first portion of said guard and operable to emit light;

a light receiving device disposed on a second portion of said guard and configured to receive light emitted from said light emitting device; and

a controller electrically connected to said light receiving device and operable to initiate a protective operation when an object interrupts the light being received by said light receiving device.

7. A method of alerting a user in close proximity to an active portion of a power tool, comprising:

providing an electrostatic charge generator disposed proximate to the active portion of the power tool;

generating an electrostatic charge on the active portion of the power tool; and

transferring a charge from the active portion of the power tool to the user, the user being in close proximity to the active portion thereby alerting the user of its close proximity to the active portion of the power tool.

8. A method for detecting the presence of an operator's extremity during the operation of a power tool comprising:

providing a transmitter disposed proximate to an active portion of the power tool;

providing a receiver disposed proximate to said transmitter;

transmitting a signal from said transmitter toward a workpiece being fed into said active portion of the power tool;

receiving said signal by said receiver;

determining depth of said workpiece based on said signal received by said receiver; and

activating a protective operation upon detecting a change in the depth of the workpiece.

9. The method of claim 8 wherein said transmitter is an ultrasound sensor.

10. The method of claim 8 wherein said transmitter is a depth sensor.

11. A method for detecting the presence of an operator's extremity during the operation of a power tool, comprising:

providing a light emitting device disposed proximate to an active portion of the power tool;

providing a light receiving device disposed proximate to the active portion of the power tool and configured to receive light emitted from said light emitting device;

transmitting light from said light emitting device to said light receiving device;

determining thickness of a workpiece being translated between said light emitting device and said light receiving device, where the measured thickness of the workpiece is based on the amount of light received by said light receiving device; and

activating a protective operation upon detecting a change in the thickness of the workpiece.

12 The method of claim 11 wherein the step of determining the thickness of said workpiece includes comparing a change in an amount of light received by said light receiving device.

13. A method for detecting the presence of an operator's extremity during the operation of a power tool comprising:

transmitting an electrical signal from a transmitter through a plurality of signal sending emitters disposed adjacent to an active portion of the power tool;

receiving said electrical signal at a receiver adjacent to said active portion defining a measured value;

comparing said measured value to a predetermined threshold; and

activating a protective operation if said measured value falls outside said predetermined threshold.

14. A safety mechanism for protecting a user from an active portion of a power tool, comprising:

a guard disposed proximate to the active portion of the power tool, the guard providing a barrier between the active portion of the power tool and the user, said guard operable to translate between a first position and a second position, said first position leaving a portion of the active portion of the power tool exposed, said second position leaving a smaller amount of said portion of the active portion of the power tool exposed;

an engagement member disposed on said guard and operable to engage the active portion of the power tool; and

a trigger device operable to deploy said engagement member into engagement with the active portion of the power tool, thereby rapidly translating said guard from said first position to said second position.

15. A safety mechanism for alerting a user of a nearby active portion of a power tool, comprising:

a plurality of flexible longitudinal members radially disposed around the active portion of the power tool, said wire elements operable to concurrently rotate with the active portion of the power tool during operation thereof, said wire elements extending a distance beyond an outermost edge of the active portion of the power tool, thereby contacting an extremity of the user and alerting the user prior to the user contacting the active portion of the power tool.

16. The safety mechanism of claim 15 wherein the power tool is further defined as a miter saw such that the plurality of flexible longitudinal members are coupled to an arbor of said miter saw.

17. A safety mechanism for protecting an extremity of a user from an active portion of a power tool, comprising:

a first gear fixed for rotatable movement with the active portion of the power tool;

a second gear selectively fixed for rotation with said first gear;

a longitudinal member disposed on said second gear for rotation therewith, said longitudinal member extending a distance beyond an outermost edge of the active portion of the power tool, said longitudinal member operable to translate adjacent to the active portion of the power tool; and

an actuation member for deploying said second gear into an intermeshed relationship with said first gear, said longitudinal member thereby rotating adjacent to the active portion of the power tool to urge the user's extremity away from the active portion of the power tool.

18. A safety mechanism for protecting an extremity of a user from an active portion of a power tool, comprising:

a rigid plate member having a planar work surface, the active portion extending through a passage formed in said rigid plate member in a first position, said plate member movable from said first position to a second position whereby said plate member extends at a position beyond an outer circumference of the active portion of the power tool; and

an actuation mechanism operable to deploy said rigid plate member from said first position to said second position thereby urging a nearby user extremity away from the active portion of the power tool.

19. A safety mechanism for protecting an extremity of a user from an active portion of a power tool, comprising:

a table portion of the power tool;

a support arm pivotally coupling said table portion of the power tool to the active portion of the power tool;

a longitudinal member disposed proximate to the active portion of the power tool, said longitudinal member operable to translate from a first position away from the table portion of the power tool to a position slidably engaging said table portion; and

an actuation mechanism for deploying said longitudinal member from said first position to said second position, thereby pivoting said support arm and active portion of the power tool away from said table portion of the power tool.

20. A safety mechanism for protecting an extremity of a user from an active portion of a power tool comprising:

an inflatable vessel disposed proximate to the active portion of the power tool;
and

an inflation device for rapidly inflating said inflatable vessel, thereby expanding said inflatable vessel in a direction toward the user extremity and thus urging the user extremity away from the active portion of the power tool.

21. A safety mechanism for protecting a user from an active portion of a power tool, comprising:

a guard disposed proximate to the active portion of the power tool, the guard providing a barrier between the active portion of the power tool and the user, said guard operable to translate between a first position and a second position, said first position leaving a portion of the active portion of the power tool exposed, said second position leaving a smaller amount of said portion of the active portion of the power tool exposed;
and

a deployment mechanism disposed on a frame of the power tool adjacent said guard, said deployment mechanism operable to translate said guard from said first position to said second position.

22. The safety mechanism of claim 21 wherein said deployment mechanism further comprises an electrically actuated charge.

23. The safety mechanism of claim 21 wherein said deployment mechanism further comprises an explosive device.

24. A safety mechanism for protecting an extremity of a user from an active portion of a power tool, comprising:

an electromagnet disposed on a portion of the power tool adjacent the active portion thereof;

a projectile magnet magnetically coupled to said electromagnet and configured to project towards an area of the power tool at which a workpiece intersects with the active portion of the power tool; and

a controller electrically connected to the electromagnet and operable to deploy the projectile magnet from the electromagnet, thereby deflecting the extremity of the user from the active portion of the power tool.

25. The safety mechanism of claim 24 wherein the controller is operable to change the polarity of said electromagnet, thereby causing deployment of said electromagnet.

26. The safety mechanism of claim 24, further comprising a sensing mechanism disposed proximate to the active portion of the power tool and operable to detect a dangerous condition relative to the operation of the power tool, said controller being operable to deploy said projectile magnet upon detection of a dangerous condition by said sensing mechanism.

27. A safety mechanism for stopping a saw blade of a power tool, comprising:
a frame member interconnected to the active portion of the power tool, said frame member including a brake member extending therefrom in a first position adjacent to the active portion;

a biasing member coupled on a first end to said frame member adjacent said brake member and on a second end to an arbor of the power tool, said biasing member biasing said brake member to said first position; and

a gearing member engaged to said frame member, said gearing member movable to translate said brake member through said frame member from said first position to a second position whereby said brake member engages the active portion of the power tool thereby bringing the active portion of the power tool to a complete stop.

28. A safety mechanism for protecting a user from an active portion of a power tool, comprising:

a frame member extending proximate to the active portion of the power tool;

a strap including a first end releasably coupled to a retaining member and a second end disposed on said frame member, said retaining member movable from a first position whereby said strap is coupled thereto and a second position whereby said strap is uncoupled therefrom;

a biasing member disposed adjacent to said strap, said biasing member biasing said strap into said active portion of the power tool when said retaining member is in said second position; and

a friction device cooperating with said strap for slowing the active portion of the power tool as said strap engages said active portion of the power tool.

29. A safety mechanism for protecting a user from an active portion of a power tool, comprising:

a frame member extending proximate to the active portion of the power tool;

an arm rotatably coupled to said frame member on a first end and coupled to the active portion of the power tool on an opposite end; and

a strap including a first end coupled to a retaining member and a second end disposed on said frame member, said retaining member movable between a first position and a second position, said retaining member located adjacent to the active portion of the power tool in said first position, said retaining member engaged to the active portion of the power tool in said second position, said arm configured to rotate upward upon engagement of said retaining member with the active portion of the power tool thereby moving said active portion of the power tool away from the user.

30. A safety mechanism for protecting a user from an active portion of a power tool, comprising:

a frame member extending proximate to the active portion of the power tool;

a strap coupled to a shuttle on a first end and disposed on said frame member on an opposite end;

a first biasing member for biasing said shuttle toward the active portion of the power tool; and

a release mechanism for deploying said shuttle from a first position whereby said shuttle is retained by said release mechanism to a second position whereby said release mechanism releases said shuttle toward the active portion of the power tool, said shuttle operable to grasp the active portion of the power tool and thereby translate the active portion of the power tool away from the user about a pivot point disposed on said frame member.

31. The safety mechanism of claim 30 wherein said release mechanism includes a pin member retained in said shuttle by a fuse, said pin member including a second biasing member urging said pin away from engagement with said shuttle, said fuse operable to release said pin thereby allowing said second biasing member to urge said pin away from said shuttle.

32. A safety mechanism for protecting a user from an active portion of a power tool, comprising:

- a work surface extending on a substantially perpendicular plane relative to the active portion of the power tool, the active portion extending through a passage disposed on said work surface and defining an operable position; and

- an actuation mechanism connected to the active portion of the power tool and operable to deploy said active portion of the power tool from said operable position to a retracted position where the active portion is below the plane of the work surface.

33. A safety mechanism for protecting a user from an active portion of a power tool, comprising:

- an arm coupled to the active portion of the power tool at a first end and coupled to a frame of the power tool by way of a pivot joint at a second end; and

- a pawl disposed on said frame adjacent to the active portion of the power tool, said pawl operable to displace into engagement with the active portion of the power tool thereby urging the active portion of the power tool to rotate with said arm about said pivot joint and away from the user.

34. The safety mechanism of claim 33 wherein said frame further includes a link arm extending substantially parallel from and coupled to said arm, said pawl rotatably coupled to said link arm.

35. The safety mechanism of claim 33 wherein the active portion of the power tool is driven upward upon engagement of said pawl with the active portion of the power tool.

36. A safety mechanism for protecting a user from an active portion of a power tool comprising:

an arm coupled to the active portion of the power tool at a first end and coupled to a frame of the power tool by way of a pivot joint at a second end; and

an actuation mechanism disposed on said frame adjacent to said arm and operable to actuate said arm and thus the active portion of the power tool about said pivot joint away from the user.

37. The safety mechanism of claim 36 wherein said actuation mechanism includes an explosive device.

38. The safety mechanism of claim 36 wherein said actuation mechanism includes a mechanical spring.

39. A safety pawl for engaging an active portion of a power tool, comprising:

a main body portion having a first portion coupled for pivotal rotation about a frame of the power tool, said main body portion further including a first surface including an interlocking feature arranged thereon ;

an engaging portion disposed on a second portion of said main body portion, said engaging portion including a second mating surface having a plurality of complementary grooves incorporated thereon, said second mating surface mating with said main body portion at said interlocking feature; and

a biasing member coupled to said frame of the power tool on a first end and interconnected to the pawl on an opposite end, said biasing member operable to bias the pawl into engagement with the active portion of the power tool.

40. The safety pawl of claim 39 wherein said interlocking feature includes a series of grooves formed on said first surface.

41. The safety pawl of claim 39 wherein said main body portion is comprised of polymeric material.

42. The safety pawl of claim 39 wherein said engaging portion is comprised of elastomeric material.

43. A method for engaging an active portion of a power tool with a two piece safety pawl, the method comprising:

sensing a user extremity in close proximity to the active portion of the power tool;

rotating the safety pawl about a frame of the power tool into contact with the active portion of the power tool, the safety pawl having a removable engagement portion for engaging the active portion of the power tool;

removing the engagement portion of the safety pawl; and

inserting a new engagement portion onto the safety pawl.

44. The method of claim 43 wherein the step of removing the engagement portion includes the step of withdrawing the engagement portion from the active portion of the power tool.

45. A release mechanism for releasing an engaging member into an active portion of a power tool, said release mechanism comprising:

a biasing member having a first end and a second end, said first end coupled to a portion of the power tool and said second end coupled to the engaging member, said biasing member biasing the engaging member toward the active portion of the power tool;

a first magnet disposed on a portion of the engaging member;

a second magnet disposed on a portion of the power tool, said second magnet normally attracted to said first magnet with sufficient force to overcome the bias of said biasing member and maintain the engaging member in a position away from the active portion of the power tool; and

a coil disposed around one of said first and second magnets for controlling the polarity thereof, said coil operable to change the polarity of said one of said first and second magnets thereby allowing said biasing member to urge the engaging member toward the active portion of the power tool.

46. A release mechanism for releasing an engaging member into an active portion of a power tool, said release mechanism comprising:

a biasing member coupled to a portion of the power tool on a first end and coupled to the engaging member on a second end, said biasing member biasing the engaging member toward the active portion of the power tool;

a fuse element selectively coupling the engaging member to a portion of the power tool away from the active portion of the power tool; and

a controller for uncoupling said fuse element thereby allowing said biasing member to urge the engaging member toward the active portion of the power tool.

47. The release mechanism of claim 46 wherein said fuse element includes an electrically conductive wire having first and second ends coupled together, said wire arranged in a loop.

48. The release mechanism of claim 46 wherein said controller applies a current to said wire thereby causing said wire to fail.

49. A safety mechanism for releasing an engaging member into an active portion of a power tool, said safety mechanism comprising:

- a biasing member coupled to a portion of the power tool on a first end and coupled to the engaging member on a second end, said biasing member biasing the engaging member toward the active portion of the power tool;

- a latch selectively coupled to a portion of the engaging member; and

- a solenoid for inducing a magnetic field thereby magnetically coupling said latch thereto in a restrained position and for selectively reducing said magnetic field in a release position, said latch actuating out of engagement with said portion of the engaging member in said release position thereby allowing said biasing member to bias the engaging member toward the active portion of the power tool.

50. A safety mechanism for protecting an extremity of a user from an active portion of a power tool, comprising:

a housing;

a deployment carrier disposed in said housing for actuating toward the active portion of the power tool;

a strap element for selectively engaging the active portion of the power tool, said strap element coupled to said deployment carrier on a first end and coupled to a storage element on an opposite end, said storage element operable to store an intermediate portion of said strap element in a first position and rapidly release said intermediate portion of said strap element in a second position, said deployment carrier coupling said first end of said strap element to the active portion of the power tool in said second position;

a friction device for cooperating with one of said strap element and said storage element to rapidly slow the active portion of the power tool upon coupling of said strap element to the active portion of the power tool; and

a deployment mechanism for deploying said deployment carrier toward the active portion of the power tool.

51. The safety mechanism of claim 50 wherein said strap element includes light-weight fiber material.

52. The safety mechanism of claim 50 wherein said friction device includes a drum rotating adjacent a disk member, said drum including said strap element coiled therearound, one of said drum and disk member including a friction material disposed thereon, said friction material resisting rotation of said drum and thereby deployment of said strap element upon coupling of said strap element to the active portion of the power tool.

53. The safety mechanism of claim 50 wherein said strap element is secured in channels arranged on said deployment carrier.

54. A safety mechanism for protecting an extremity of a user from an active portion of a power tool, comprising:

- a support arm pivotally coupling a frame of the power tool to the active portion of the power tool;

- a strap element disposed in a first position proximate to the active portion of the power tool;

- a deployment module disposed on the power tool, said deployment module cooperating with said strap element to displace said strap element from said first position to a second position whereby an engaging portion of said strap element engages the active portion of the power tool; and

- a friction element for slowing the deployment of said strap element upon engagement of said engaging portion of said strap element to the active portion of the power tool.

55. A safety mechanism for protecting an extremity of a user from an active portion of a power tool, comprising:

a frame of the power tool including a working surface for sliding a workpiece therealong into engagement with the active portion of the power tool;

a support arm having a first end coupled to a frame of the power tool at a pivot joint and a second end coupled to the active portion of the power tool; and

a selectively expandable element coupled to said frame of the power tool at a first end and coupled to said support arm on an opposite end, said expandable element operable to displace said support arm about said pivot joint from a first position whereby the active portion of the power tool is proximate to said working surface to a second position whereby said support arm and thus said active portion of the power tool are displaced away from said working surface.

56. A safety mechanism for protecting an extremity of a user from an active portion of a power tool comprising:

a support arm pivotally coupling a frame of the power tool to the active portion of the power tool;

a first gear disposed on said support arm and fixed for rotation therewith;

a second gear disposed on one of said frame and support arm, said second gear operable to engage said first gear and rotate said first gear thereby pivoting the support arm and active portion upward and away from contact with the user; and

a sensing mechanism disposed proximate to the active portion of the power tool and operable to detect a dangerous condition relative to the operation of the power tool, the sensing mechanism being operable to deploy said second gear into an intermeshed relationship with said first gear.

57. A safety mechanism for protecting an extremity of a user from an active portion of a power tool, comprising:

a frame of the power tool including a support structure for coupling the active portion of the power tool thereto;

a firing device disposed proximate to the active portion of the power tool for deploying a projectile into engagement with the active portion of the power tool, said projectile operable to preclude further rotation of the active portion of the power tool upon engagement therewith; and

a sensing mechanism disposed proximate to the active portion of the power tool and operable to detect a dangerous condition relative to the operation of the power tool, the sensing mechanism being operable to trigger said firing device.

58. The safety mechanism of claim 57 wherein said firing device is coupled to a guard of the power tool, the guard partially covering a portion of the active portion of the power tool.

59. The safety mechanism of claim 57 wherein said firing device includes an explosive device.

60. A safety mechanism for precluding further movement of an active portion of a power tool, comprising:

- a saw blade including a plurality of apertures radially displaced therearound;

- a rod movable from a first position whereby said rod is maintained in a static position proximate to said saw blade to a second position whereby said rod is actuated through one of said plurality of apertures, said rod operable in said second position to resist movement of said saw blade;

- a biasing member for selectively urging said rod into said second position; and

- a sensing mechanism disposed proximate to the active portion of the power tool and operable to detect a dangerous condition relative to the operation of the power tool, the sensing mechanism being operable to release said rod from said first position thereby allowing said biasing member to urge said rod into said second position.

61. A safety mechanism for precluding rotation of an active portion of a power tool, the safety mechanism comprising:

- a saw blade;

- at least one cam member disposed in a first position proximate to said saw blade;

- a retaining member retaining said at least one cam member in said first position;

- a biasing member for biasing said at least one cam member toward said saw blade; and

- a release mechanism cooperating with said at least one cam member for urging said at least one cam member from said first position to a second position whereby said at least one cam member engages said blade to bring said saw blade to a complete stop.

62. The release mechanism of claim 61 wherein said release mechanism includes a fuse member interconnected between an electric module and a spacer, said electric module operable to send a high current charge onto said fuse thereby failing said fuse and releasing said retaining member allowing said at least one cam to actuate toward said saw blade.

63. A safety mechanism for selectively inhibiting rotation of an active portion of a power tool, comprising:

- a first gear fixed for rotation with the active portion of the power tool;

- a second gear drivingly connected to said first gear; and

- a deployment element selectively movable from a first position whereby said deployment element is statically arranged proximate to said first and second gear to a second position whereby said deployment element is displaced into engagement with at least one of said first and second gear thereby precluding rotation of said at least one of said first and second gear and thus the active portion of the power tool.

64. The safety mechanism of claim 63 wherein said deployment is biased toward said second position.

65. A protection mechanism for protecting a drive system of a power tool upon a rapid stop event of an active portion of said power tool, comprising:

- a spindle for mounting a saw blade therearound, said spindle rotating in a first operating mode concurrently with said saw blade and rotating independently from said saw blade in a second operating mode; and

- a saw clamp selectively coupled to a saw blade, said saw clamp including a breakaway portion for selectively coupling said saw clamp to said spindle, said breakaway portion operable to maintain said saw clamp in said first operating mode and operable to disengage said saw clamp from said spindle thereby allowing said spindle to rotate in said second operating mode.

66. A safety mechanism for precluding rotation of an active portion of a power tool, comprising:

a saw blade rotatably coupled to the power tool;

a cam member disposed adjacent to said saw blade, said cam member movable from a first position whereby said cam member is restrained away from said saw blade to a second position whereby said cam member is actuated into said saw blade, said cam member operable to preclude rotation of said saw blade upon engagement with said saw blade;

a latch for selectively releasing said cam member from said first position to said second position; and

a biasing member for biasing said cam member into said saw blade.

67. A safety mechanism for protecting an extremity of a user from an active portion of a power tool, comprising:

a saw blade fixed for rotation on the power tool; and

a plurality of guard members radially mounted around said saw blade, said guard members movable from a first position whereby said guard members extend to a position within an outer edge of said saw blade to a position whereby said guard members extend to a position beyond said outer edge of said saw blade.

68. A safety system for retracting a saw blade of a table saw under the table portion of the table saw to prevent contact between the operator and the saw blade, comprising:

an arbor bracket supporting the rotating saw blade of the table saw and coupled to a portion of the table saw for positioning the rotating saw blade relative to the table portion of the table saw;

a sector gear adapted to translate along a portion of said arbor bracket, said sector gear including a gearing portion;

a clutch mechanism releasably coupling said arbor bracket to said sector gear;

a selection mechanism engaging the gearing portion of said sector gear and operable to control the position of said sector gear; and

an actuating device coupled to said arbor bracket and said sector gear, said actuating device operable to translate said arbor bracket relative to said sector gear to prevent contact between the saw blade and the operator.

69. A method for detecting operator contact with an active portion of a woodworking machine, comprising:

transmitting an electrical signal from a transmitter to a receiver, said transmitter being electrically coupled to the active portion of the power tool which is in turn electrically coupled to said receiver;

detecting said electrical signal at said receiver;

deriving a threshold value indicative of operator contact with the active portion of the power tool;

adjusting said threshold value based on an electrical load associated with the operation of the active portion of the power tool; and

activating a protective operation in relation to the active portion of the power tool when said electrical signal exceeds said threshold value.

70. The method according to Claim 69, further comprising the steps of comparing said electrical signal detected at said receiver to a reference value and adjusting said electrical signal from said transmitter based on the comparison of said electrical signal detected at said receiver to said reference value.

71. A contact detection system for a power tool having an active portion; comprising:

- a transmitter capacitively coupled to the active portion of the power tool and operable to transmit an electrical signal to the active portion of the power tool;

- a receiver capacitively coupled to the active portion of the power tool and operable to receive said electrical signal transmitted to the active portion of the power tool; and

- a detection circuit electrically connected to said receiver, said detection circuit operable to derive a threshold value indicative of operator contact with the active portion of the power tool and to activate a protective operation in relation to the active portion of the power tool when said electrical signal exceeds said threshold value, where said detection circuit adjusts said threshold value based on an electrical load associated with the operation of the active portion of the power tool.

72. A contact detection system for a power tool having an active portion; comprising:

a transmitter capacitively coupled to the active portion of the power tool and operable to transmit an electrical signal to the active portion of the power tool;

a receiver capacitively coupled to the active portion of the power tool and operable to receive said electrical signal transmitted to the active portion of the power tool; and

a controller connected to said receiver, said controller operable to detect a variation in said electrical signal and to activate a protective operation in relation to the active portion of the power tool when said variation in said electrical signal exceeds said threshold value, where said detection circuit adjusts said threshold value based on an electrical load associated with the operation of the active portion of the power tool.

73. A braking system for stopping a rotating circular saw blade of a power tool rapidly, the system comprising:

a rigid base member;

an arm having a first and a second end, the first end of the arm rotatably coupled to the rigid base member, the second end of the arm coupled to the rotating circular saw blade;

a brake device coupled to the arm, the brake device operable to engage the circular saw blade to stop rotation of the circular saw blade; and

an activation device coupled to the brake device and the rigid base member, the activation device including an explosive charge operable to compel the brake device into engagement with the circular saw blade upon the occurrence of a predetermined event.

74. A safety mechanism for precluding rotation of an active portion of a power tool, comprising:

a saw blade rotatably coupled to the power tool;

a cam member disposed adjacent to and fixed for rotation with said saw blade;

a link arm selectively movable from a first position adjacent said cam member to a second position in communication with said cam member; and

a brake coupled to said link arm, said brake movable from a position adjacent said saw blade to a position engaging with said saw blade upon movement of said link arm to said second position.

75. A mounting arrangement of a power tool for selectively aligning a brake into proper orientation with one of a plurality of saw blades having different diameters:

a saw blade coupled to the power tool;

an arbor bracket for rotatably coupling said saw blade to the power tool, said arbor bracket extending laterally from said saw blade and including a slot formed on an outer portion thereof; and

a brake selectively slidably interconnected to said arbor bracket at said slot, said brake movable along said slot for positioning said brake at varying degrees of proximity relative to said saw blade for accommodating a saw blade of the one of a plurality of saw blades having a distinct diameter from the other of said plurality of saw blades.